REMARKS

Claims 1-6 and 8-10 are pending in the application. All claims were rejected. In response independent Claims 1 and 7 were amended.

The Examiner rejected Claims 1-16 under 35 U.S.C.§112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one of ordinary skill in the art to make or use the invention. The Examiner further rejected Claims 1-6 and 8-10 under 35 U.S.C.§103(a) as being unpatentable over U.S. Patent Application Publication No. 2002/0020919 (Li) in view of U.S. Patent No. 5,939,763 (Hao). Claims 7 and 11-16 were rejected under 35 U.S.C.§103(a) as being unpatentable over U.S. Patent No. 6,228,761 (Ngo) in view of Li and Hao.

Rejection under 35 U.S.C. §112

Examiner states that the language of Claims 1 and 7 reading "wherein the central portion is substantially devoid of nitrogen" is not supported by the disclosed specification. However, the inventive application discloses, for example, formation of the central portion using materials substantially devoid of nitrogen (see application p.7, lines 15-23). Further, the upper and lower regions with elevated nitrogen concentration will prevent diffusion of impurities, e.g. nitrogen, into the central portion. The central portion will thus be substantially devoid of nitrogen. Therefore, one of ordinary skill in the art will be enabled to make or use the invention as claimed.

Rejection 35 U.S.C.§103(a)

In contrast to Claim 1 of the present invention, Hao discloses a **dielectric layer**, having upper and lower regions with elevated concentrations of nitrogen. The ultra-thin dielectric layer of Hao is taught to be significantly thicker than a diffusion barrier layer claimed in Claims 1 and 7 of the present invention. Specifically, Hao discloses that ultra-thin dielectric layers typically are on the order of 100 Angstroms in thickness (see Hao column 1, lines 39-42) and discloses no oxide layer thinner than 45 Angstroms (see Hao column 7, lines 28-30). The present invention discloses no diffusion barrier layer thicker than about 120 nm (specification page 7, lines 23-24) and claims the diffusion barrier layer being between about 5 nm and about 120 nm in thickness

in amended Claims 1 and 7. There is a difference of 4 to 9-fold between these measurements, which would imply a significant difference in structure to one of ordinary skill in the art. This difference is further reinforced by the fact that the dielectric layer of Hao must act as a dielectric layer, while the present invention only acts as a diffusion barrier layer.

Second, Hao teaches a dielectric layer, which must act as a dielectric in addition to the upper and lower regions with elevated nitrogen concentration acting as diffusion barrier regions. In contrast, the present invention recites in amended Claims 1 and 7 the diffusion barrier layer having a low dielectric constant. Support for this claimed element is found on page 4, lines 4-9 of the inventive specification. This is a substantial difference in composition and/or structure between the diffusion barrier layer claimed in amended Claims 1 and 7 and the dielectric layer of Hao.

Finally, the Examiner states that Li does not disclose an upper and a lower region with elevated concentrations of nitrogen and a central region substantially devoid of nitrogen; thus, Li does not cure the deficiencies of Hao. It is therefore concluded that neither Li, Hao, nor the combination thereof teach or suggest the diffusion barrier layer comprising nitrogen possessing a low dielectric constant that is between about 5 nm and about 120 nm in thickness as claimed in amended Claims 1 and 7.

With regard to rejection of Claims 7 and 11-16, the Examiner agrees that Ngo does not disclose the inventive diffusion barrier layer, it can therefore be concluded, in view of the above discussion, that Ngo, Li, Hao, or any combination thereof teach or suggest the diffusion barrier layer claimed in amended Claim 7.

Without conceding patentability per se of dependent Claims 2-6 and 8-16, it is respectfully submitted that they are allowable by virtue of their dependence on independent Claims 1 and Claim 7 respectively.

Applicants submit that pending Claims 1-16 are believed to be in condition for allowance. Allowance is respectfully requested. Should the Examiner believe that a telephone conference or personal interview would facilitate resolution of any remaining matters, the Examiner may contact Applicants' attorney at the number given below.

Respectfully submitted,

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